Achieving Better Buying Power through Acquisition of Open Architecture Software Systems for Web-Based and Mobile Devices

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Overview

- Recent trends in open architecture (OA) software systems

- Emerging challenges in achieving *Better Buying Power* (BBP) via OA software systems for Web-based and Mobile devices

- New practices to realize cost-effective acquisition of OA software systems

- Conclusions

Recent trends in OA software systems

- Multi-party acquisition and OA development ecosystems

- Shared development of Apps and Widgets as OA system components and capabilities

- Growing diversity of challenges in cybersecurity

- New business models for OA software component development and use

Multi-party acquisition and OA development ecosystems
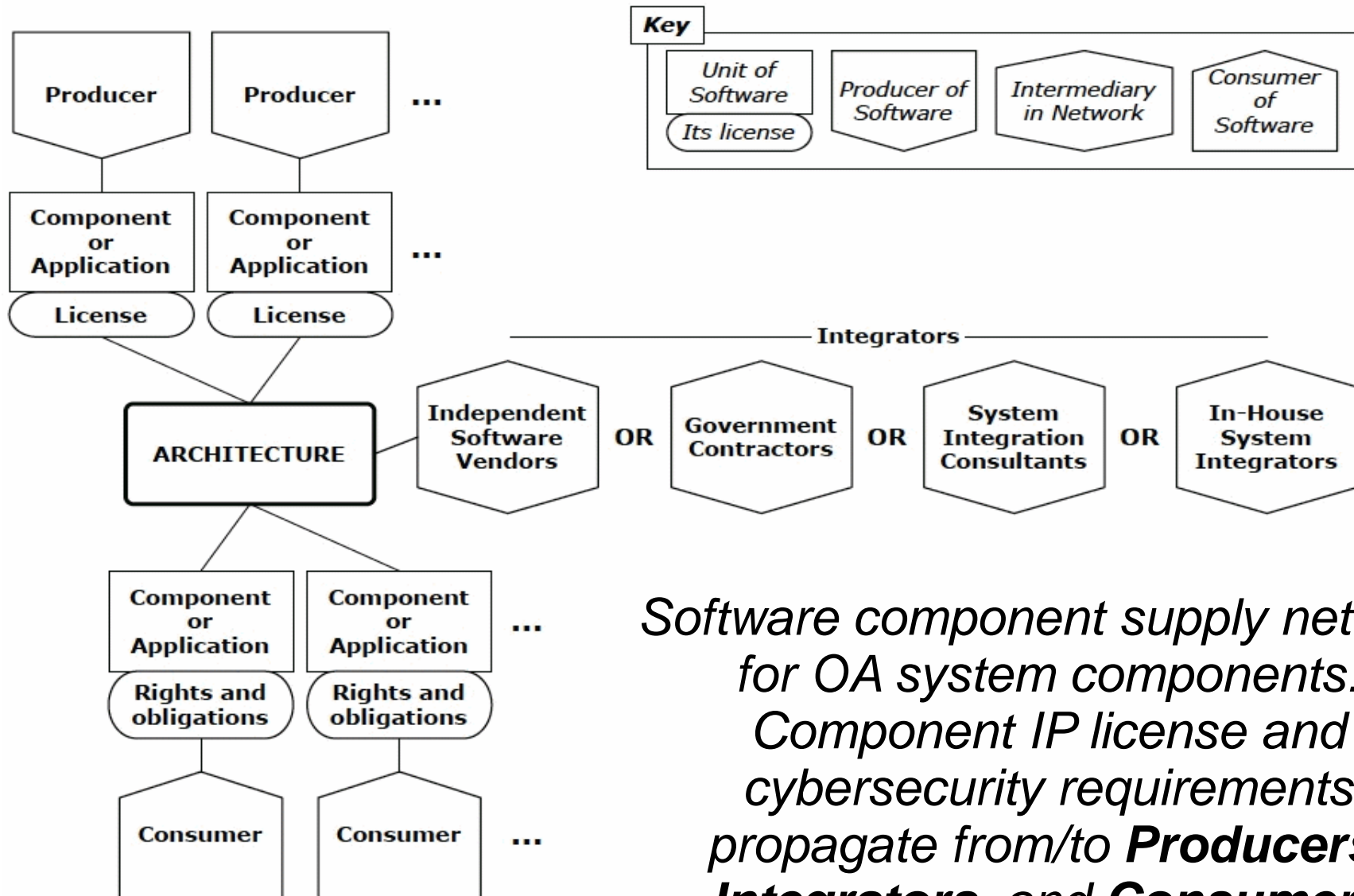
*Software component supply network for OA system components: Component IP license and cybersecurity requirements propagate from/to **Producers, Integrators,** and **Consumers***

Multi-party acquisition of *assembled capabilities* within OA development ecosystems
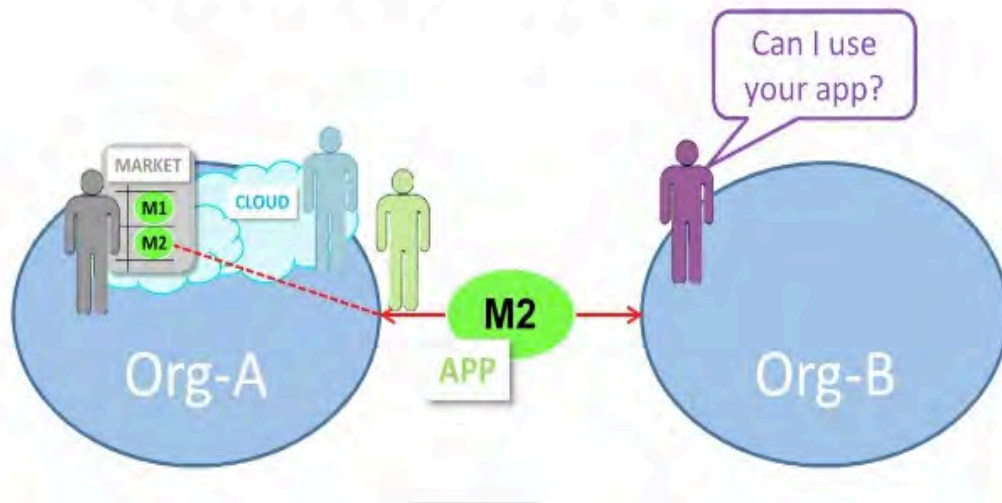
Consumer/End-User Organizations seeking ways to reduce acquisition cost and effort through shared development/use of common OA software system components (proprietary/open source Apps, Widgets).

Shared development of Web-based Apps and Widgets as OA system components
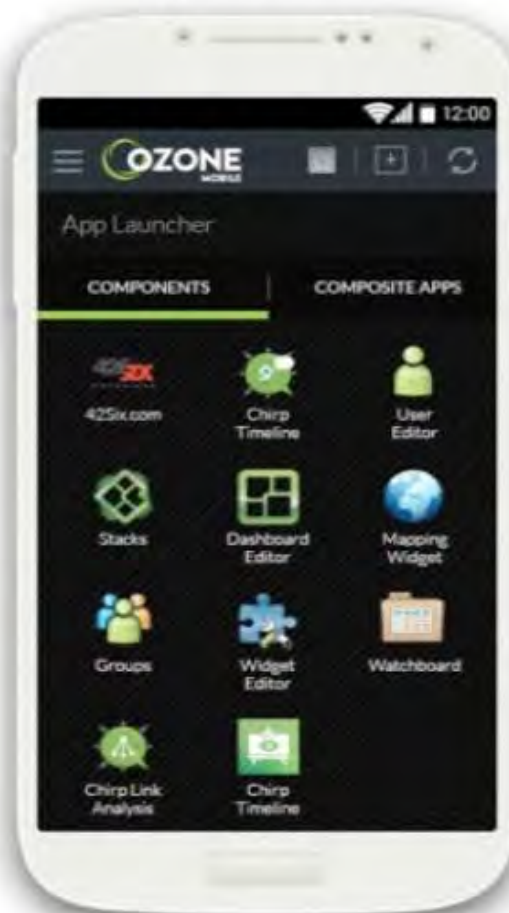

Widget Framework for Web-based PCs

Shared development of Mobile Apps and Widgets as OA system components

CAS Sign In

App Launcher

Ozone Mobile Drawer Menu

Ozone Widget Framework for Mobile Devices

Assemble capabilities using Apps/Widgets from trusted parties via sharing agreements

Widgets available within *App Store*

Commercial Mobile Apps also being used
(enterprise middleware services, not shown)
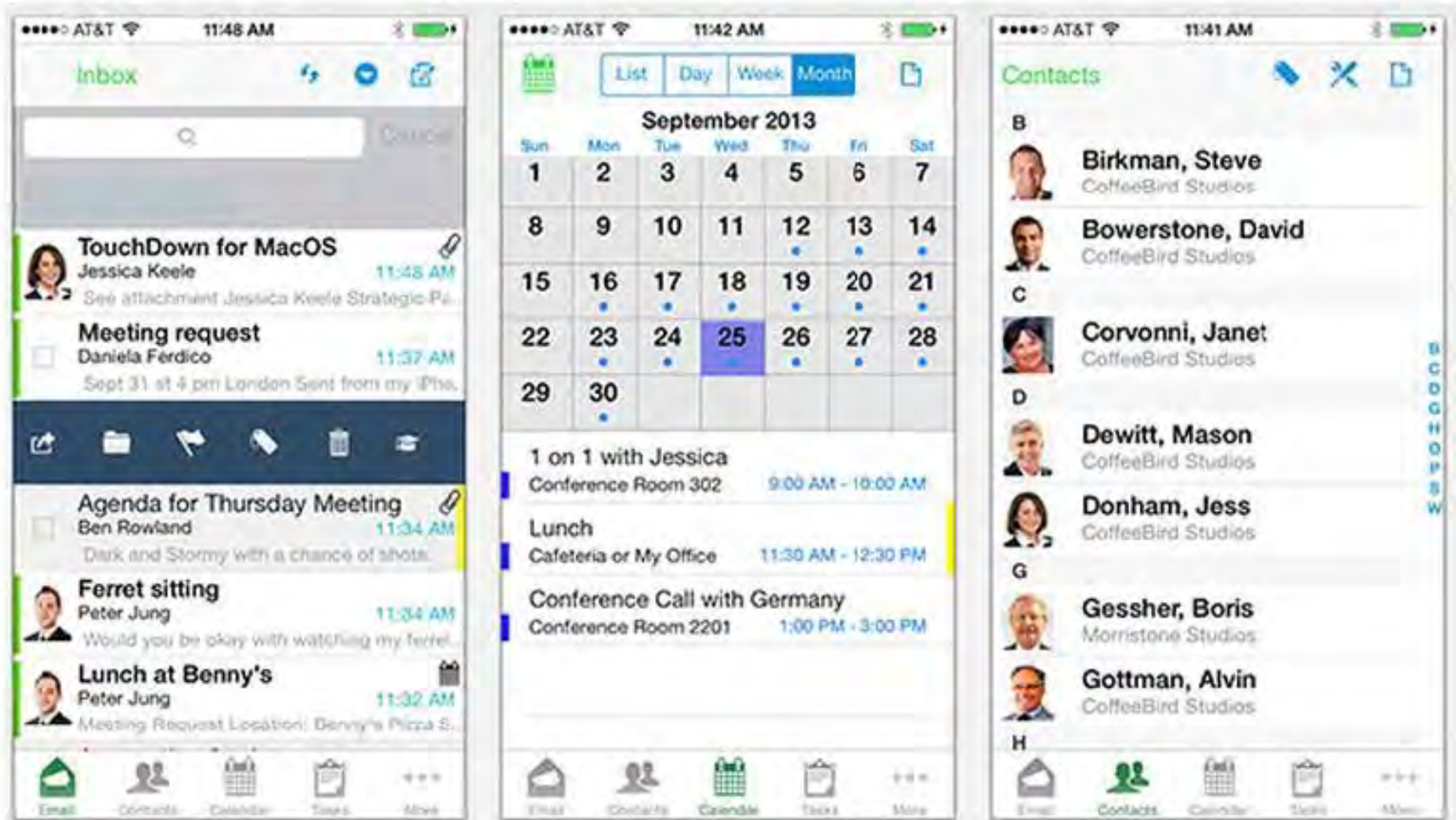
Enterprise-to-Mobile Middleware *IP Licenses*
(for the NitroDesk *Touchdown* product)

* LGPL 2.1

* Ical4j from Ben Fortuna

* Public Domain Declaration

* Apache 2

* The Legion of the Bouncy Castle

* Creative Commons BY

* Sony Mobile

* Jesse Anderson

* OpenSSL

* Apple Non-Exclusive

* SQLite

* Microsoft Public License

Multi-party acquisition and OA development ecosystems: *Multiple OA system evolution paths*
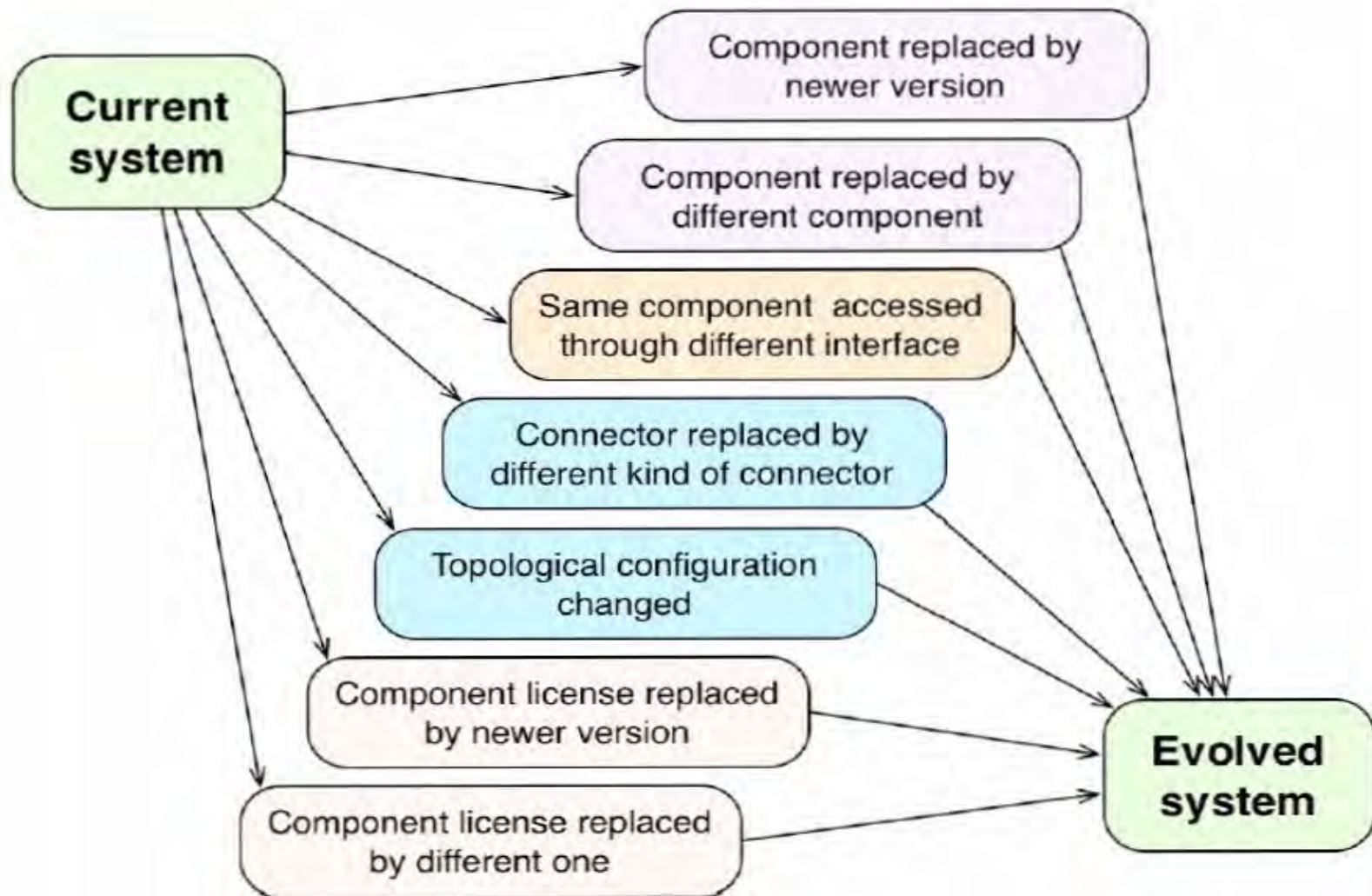
IP and cybersecurity requirements will need *continuous attention!*

Shared development of Apps and Widgets as OA system components: *Cybersecurity?*

CAS Sign In

App Launcher

Ozone Mobile Drawer Menu

Ozone Widgets supporting *"Bring Your Own Devices"* (BYOD)?

Growing diversity of challenges in cybersecurity

- Scacchi, W. and Alspaugh, T. (2012) Addressing Challenges in the Acquisition of Secure Software Systems with Open Architectures, *Proc. 9th Acquisition Research Symposium*, Vol. 1, 165-184, Naval Postgraduate School, Monterey, CA.
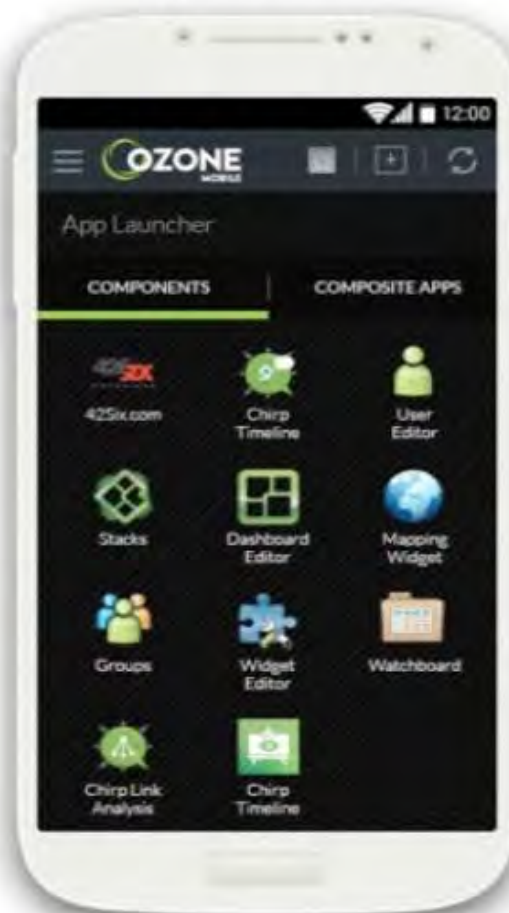
- Scacchi, W. and Alspaugh, T. (2013a). Processes in Securing Open Architecture Software Systems, *Proc. 2013 Intern. Conf. Software and System Processes*, San Francisco, CA, May 2013.

- Scacchi, W. and Alspaugh, T.A. (2013b). Streamlining the Process of Acquiring Secure Open Architecture Software Systems, *Proc. 10th Annual Acquisition Research Symposium*, Monterey, CA, 608-623, May 2013.

- Scacchi, W. and Alspaugh, T.A. (2013c). Challenges in the Development and Evolution of Secure Open Architecture Command and Control Systems, *Proc. 18th Intern. Command and Control Research and Technology Symposium*, Paper-098, Alexandria, VA, June 2013.

New business models for acquisition of OA Web/mobile software components

- Franchising

- Enterprise licensing

- Metered usage

- Advertising supported

- Subscription

- Free component, paid

  service fees

- Federated reciprocity for shared development

- Collaborative buying

- Donation

- Sponsorship

- (Government) open source software

- and others

Emerging challenges in achieving BBP via OA Web/mobile software systems

- Acquisition program managers/staff *may not understand* how software IP licenses affect OA system design, and vice-versa.

- Software IP and cybersecurity obligations and rights propagate across system development, deployment, and evolution activities *in ways not well understood* by system developers, integrators, end-users, or acquisition managers.

Emerging challenges in achieving BBP via OA Web/mobile software systems

- *Failure to understand* software IP and cybersecurity obligations and rights propagation can reduce DoD buying power, increase software life cycle costs, and reduce competition.

- DoD and other Government agencies *would financially and administratively benefit* from engaging the development and deployment of an (open source) automated *software obligations and rights management system* (SORMS) for the acquisition workforce.

New practices to realize cost-effective acquisition of OA software systems

- Need to R&D **worked examples** of reference OA system models, assembled capabilities, and component evolution alternatives.

- Need **open source models of** app/widget security assurance **processes and** reusable cybersecurity **requirements.**

New practices to realize cost-effective acquisition of OA software systems

- Need precise **domain-specific languages** (DSLs) and **automated analysis tools** for continuously assessing and continuously improving cybersecurity and IP requirements for OA C2 systems composed from apps/widgets.

    - Need a *software obligations and rights management system* (SORMS) to streamline Web/mobile software component acquisition

Conclusions

- Our research identifies how new Web/mobile software component technologies, IP and security requirements, and new business models interact to *drive-down <u>or</u> drive-up* acquisition costs.

- Managing acquisition costs for OA Web/mobile software components will be demanding.

- Acquisition workforce will need automated assistance, *else acquisition process costs will dominate development costs* for OA Web/mobile software components!

Conclusions

- New technical risks for component-based OA software systems can dilute the cost-effectiveness of BBP efforts.

- Need R&D leading to automated systems (SORMS) that can model and analyze OA system IP licenses and cybersecurity requirements

  - SORMS will empower the acquisition workforce, and

  - Identify and manage cost-effectiveness trade-offs

Acknowledgements

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